UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
55 Great Republic Drive
Gloucester, MA 01930-2276

DEC 19 2011

John H. Nagle
Industrial Permits Branch
Office of Ecosystem Protection
US Environmental Protection Agency, Region I
5 Post Office Square, Suite 100
Boston, Massachusetts 02109-3912

Re: Reissuance of the NPDES Permit for the Chicopee Water Pollution Control Facility (Permit No. MA0101508) in Chicopee, MA

Dear Mr. Nagle,

Your letter dated August 15, 2011, requested consultation pursuant to Section 7 of the Endangered Species Act (ESA) of 1973, as amended, regarding the reissuance of the National Pollutant Discharge Elimination System (NPDES) permit for the Chicopee Water Pollution Control Facility (WPCF) (Permit No. MA0101508) in Chicopee, MA. The permit under consideration will supersede the permit issued on May 17, 2005, and will re-authorize discharges of treated wastewater from the secondary wastewater treatment facility located in Chicopee, as well as discharges from eighteen (18) Combined Sewer Overflow (CSO) outfalls, into the Connecticut and Chicopee Rivers and Willimansett Brook. The WPCF treats sanitary and industrial wastewater and an Industrial Pretreatment Program is in place under the draft permit. Additionally, the permit will provide effluent limitations and monitoring conditions for the Jones Ferry CSO Treatment Facility, which processes the effluent that discharges from CSO Diversion Structure 7.1 into the Connecticut River. Based on the location of the discharges, the proposed permit limits, and an analysis of potential water quality impacts, the Environmental Protection Agency (EPA) has made the preliminary determination that the discharges to be authorized at these facilities and CSOs are not likely to adversely affect species listed by NOAA's National Marine Fisheries Service (NMFS). We concur with this determination and the justification for this conclusion is presented below.

Chicopee WPCF and Associated Discharges

The Chicopee WPCF is a 15.5 MGD secondary treatment facility that serves a population of approximately 55,000. The plant treats sanitary and industrial wastewater and is a pure oxygen activated sludge treatment facility. The collection system is 50% separate sanitary sewer and 50% combined sewers, with eighteen (18) CSO outfalls throughout the city. Eight (8) CSOs are on the Connecticut River, nine (9) are on the Chicopee River, and one (1) is present on

Willimansett Brook (a tributary to the Chicopee River). CSO discharges occur during large wet weather events (i.e., storms) when the capacity of the combined sewer collection system is exceeded resulting in excess flow, which is comprised of a mixture of sewage and storm water runoff. Most of the time, combined sewer systems transport all of their wastewater to a sewage treatment plant, where it is treated before it is discharged. During storms, however, the wastewater volume in a combined sewer system can exceed the capacity of the sewer system or treatment plant, resulting in overflow. The Jones Ferry CSO Treatment Facility provides screening, limited solids removal, disinfection, and dechlorination for CSO discharges that enter the Connecticut River through outfall 7.1. The Jones Ferry facility also provides storage for smaller CSO flows that can then be sent to the WPCF for secondary treatment.

The WPCF is located on the east bank of the Connecticut River, approximately 5 miles downstream from the Holyoke Dam. The WPCF employs technology based limitations that provide a specified level of pollutant-reducing technology available and economically achievable for the type of facility being permitted; as well as water quality based effluent limits that are designed to ensure that state water quality standards are met. The calculated dilution factor for the facility is 81:1, based on the conservative 7Q10 low flow conditions. Effluent from Chicopee WPCF is discharged into the Connecticut River, which is classified in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00 as a Class B – warm water fishery, with a CSO qualifier, in this portion of the river. The portion of the Chicopee River where discharges occur is also Class B – warm water fishery, with a CSO qualifier. Willimansett Brook is a Class B water body. A CSO qualifier, 314 CMR 4.06, is used to indicate that CSO impacts occur, but excursions above the Massachusetts Surface Water Quality Standards are not permitted and constitute a violation of the permit if they do occur. This differs from a Class B (CSO) where there is a permanent downgrading of the water quality classification that can only occur after a Use Attainability Analysis (UAA). Class B waters are designated as habitat for fish, other aquatic life, and wildlife, including for their reproduction, migration, growth, and other crucial functions, in addition for primary and secondary contact recreation. The Massachusetts Surface Water Quality Standards define warm water fisheries as waters with a maximum mean monthly temperature that does not exceed 68°F (20°C) during the summer months, and are not capable of sustaining a year-round population of cold water stenothermal aquatic life. Waters classified as class B warm water fisheries have dissolved oxygen levels $\geq$ 5.0 mg/L, pH in the range of 6.5-8.3, and *Escherichia coli* colony counts of 126 colony forming units (cfu)/100mL on average with no single sample containing more than 235 cfu/100 mL.

The *Massachusetts Year 2008 Integrated List of Waters* 303(d) list identifies the Connecticut and Chicopee Rivers as Category 5 receiving waters, which means these river segments require TMDLs. Both rivers have been designated as impaired for pathogens due to CSO discharges and the Connecticut River has also been designated as impaired for PCBs (in fish tissue) and suspended solids.

The draft permit has been developed to ensure that discharges will not cause or contribute to violations of Massachusetts Water Quality Standards in the Connecticut and Chicopee Rivers and Willimansett Brook as a result of discharges from the WPCF or the CSO outfalls. The permit conditions for the WPCF include limits for pH, Total Suspended Solids (TSS), Biological

Oxygen Demand (BOD_5), and bacteria (*E. coli*). The permit also includes conditions for non-conventional pollutants including Total Residual Chlorine (TRC), nitrogen, and requires whole effluent toxicity (WET) testing four times per year with the fathead minnow (*Pimephales promelas*). Additionally, the permit includes our previous suggestion to include a second test species, brook trout (*Salvelinus fontanalis*)(if not available, rainbow trout (*Onchorynchus mykiss*) will be used), in the spring and fall tests. Sturgeon species are thought to have similar toxicity responses to those of brook trout and other salmonid species such as rainbow trout. In addition, the permit also addresses the presence of metals, and all but five toxic pollutants (all metals) were not detected or were present at levels well below the relevant water quality criteria. Of these five toxic pollutants detected, only aluminum was determined to have reasonable potential to cause or contribute to an exceedance of water quality criteria.

CSO discharges are also subject to specific conditions under the draft permit, including a prohibition on dry weather discharges from CSO outfalls, a requirement that CSO discharges shall not cause any exceedance of water quality standards, compliance with and reporting on the compliance with the technology based Nine Minimum Controls (per EPA guidance), and monitoring and reporting on the status of CSO abatement projects. As stated previously, several permit requirements and monitoring conditions exist for the Jones Ferry Treatment Facility to ensure that discharges at CSO 7.1 will not cause or contribute to water quality violations. These monitoring requirements and limits include: fecal coliform, TRC, pH, BOD^5, TSS, nitrogen monitoring, and WET testing twice per year.

NMFS Listed Species in the Action Area
Connecticut River
Shortnose Sturgeon

A population of endangered shortnose sturgeon (*Acipenser brevirostrum*) occurs in the Connecticut River. This population is largely divided by the Holyoke Dam, although limited successful downstream passage does occur. Modifications to the facility are currently ongoing to ensure the safe and successful upstream and downstream passage of fish, including shortnose sturgeon, at the Dam.

The Holyoke Dam separates shortnose sturgeon in the Connecticut River into an upriver group (above the Dam) and a lower river group that occurs below the Dam to Long Island Sound. The abundance of the upriver group has been estimated by mark-recapture techniques using Carlin tagging (Taubert 1980) and PIT tagging (Kynard unpublished data). Estimates of total adult abundance calculated in the early 1980s range from 297 to 516 in the upriver population to 800 in the lower river population. Population estimates conducted in the 1990s indicated populations in the same range. The total upriver population estimates ranged from 297 to 714 adult shortnose sturgeon, and the size of the spawning population was estimated at 47 and 98 for the years 1992 and 1993, respectively. The lower Connecticut River population estimate for sturgeon >50 cm TL was based on a Carlin and PIT tag study from 1991 to 1993. A mean value of 875 adult shortnose sturgeon was estimated by these studies. Savoy (in press) estimates that the lower river population may be as high as 1000 individuals, based on tagging studies from 1988-2002. It has been cautioned that these numbers may overestimate the abundance of the

lower river group because the sampled area is not completely closed to downstream migration of upriver fish (Kynard 1997). Other estimates of the total adult population in the Connecticut River have reached 1200 (Kynard 1998), and based on Savoy's recent numbers, the total population may be as high as 1400 fish. Several sections of the river have been identified as concentration areas. In the downriver segment, a concentration area is located in Agawam, MA which is thought to provide summer feeding and over-wintering habitat. Other concentration areas for foraging and over wintering are located in Hartford, Connecticut, at the Head of Tide (Buckley and Kynard 1985) and in the vicinity of Portland, Connecticut (CTDEP 1992). Shortnose sturgeon also make seasonal movements into the estuary, presumably to forage (Buckley and Kynard 1985; Savoy in press). Above the Dam, there are also several concentration areas. During summer, shortnose sturgeon congregate near Deerfield. Many overwinter at Whitmore. Successful spawning has been documented at two sites in Montague and this is thought to be the primary spawning site for shortnose sturgeon in the Connecticut River.

Although shortnose sturgeon early-life stages (ELSs) have been captured downstream of the Holyoke Dam, evidence indicates that only minimal spawning occurs. In the mid 1980s, a multi-year study tracked ripe, pre-spawning adults congregating just below the Holyoke Dam (Buckley and Kynard 1985b). At that time, the capture of ripe males and females together in the spring was believed to indicate imminent spawning. The Holyoke Dam area was systematically surveyed to determine depth, velocity, and substrate present under several hydro-power flow regimes during spawning (Buckley and Kynard 1985b). Because no efforts to capture shortnose sturgeon ELS were made, it is not known if successful egg release and fertilization had occurred. Recently, additional studies to identify shortnose sturgeon spawning downstream of the Holyoke Dam were conducted. In spring 2005 and 2006, ELS nets were set during known spawning temperatures at several sites between Hartford, CT (~ river mile 52) and Springfield, MA (~ river mile 94) for a total of 62,519 m^3 of water sampled. No shortnose sturgeon ELS were captured as a result of these efforts; however, during unrelated ichthyoplankton sampling during the same years, three shortnose sturgeon larvae were captured (1 in 2005 and 2 in 2006; Kleinschmidt 2006, 2007).

One interpretation of these larval captures is that spawning may occur downstream of Holyoke Dam, perhaps at several sites. The low number of larvae captured downstream of Holyoke in 2005 and 2006 were consistent with the low numbers of ELS captured at the Montague site during the same years: 0 in 2005 (346,660 m^3 of water sampled) and 4 eggs in 2006 (106,689 m^3 of water sampled; Kieffer and Kynard in review-B). Because spawning success at Holyoke appeared to reflect success at Montague during the same years (Kynard et al. in review-C), few ELS may have been available downstream of Holyoke Dam during the 2005 and 2006 sampling resulting in the low number of ELS captures. In addition, mid-column net tows capturing ELS totaled 100 m^3 of sampled water, which is considered a very small amount of effort to capture larvae dispersed over a long distance. This suggests that increased sampling may have resulted in higher captures. The effort required to capture 13 embryos and larvae 3–15 km downstream of Montague in 1977 and 1978 was large in comparison, totaling 479.2 hours of effort (Taubert 1980). In addition, Whitworth (1996) states fall-line topography at Windsor Locks, CT (~ river mile 62) as a possible historic spawning area.

Adult and juvenile shortnose sturgeon are likely to occur in the vicinity of the facility outfall and CSO discharges year round. However, ELS are less likely to be observed since spawning occurs further upstream in the Montague area near the confluence of the Deerfield and Connecticut Rivers.

Chicopee River and Connecticut River Tributaries

Although, shortnose sturgeon are known to mainly occupy the Connecticut River in the vicinity of the city of Chicopee, shortnose sturgeon have also been observed in Connecticut River tributaries. Pre-spawning adults from the upstream segment have been tracked and captured in the lower 3.5 km of the Deerfield River, near its confluence with the Connecticut River at rkm 192. Kieffer and Kynard (in review), report a total of 30 adults (ripe males and late- and early-stage females) detected in the Deerfield River from 1991–2007 by CAFRC researchers. The confluence of the two rivers occurs just 1–2 km downstream of known spawning sites in the Connecticut River at Montague. Some adults found in the Deerfield River (late-stage males and females) continued upstream to spawn at Montague while others remained in the Deerfield River until November (Kynard et al. in review).

Sturgeon from the lower river may also use tributaries. In May 2007, an adult shortnose sturgeon from the downstream segment entered a fish trap on the Westfield River at the Design Specialties International (DSI) Dam (USFWS 2007 fish count). The DSI Dam is located ~ 9.5 km upstream of the confluence of the two rivers at rkm 122 on the Conneticut River. Although shortnose sturgeon have not been detected in the Chicopee River, evidence suggests that they will utilize available habitat in large tributaries of the Connecticut River. Willimansett Brook is a small tributary of the Chicopee River and it is unlikely that appropriate habitat exists in a smaller creek off a main tributary. It is also unlikely that shortnose sturgeon will venture that far upstream into a small brook, and therefore, impacts to shortnose sturgeon in Willimansett Brook will not be considered further.

Effects of the Action

As noted above, over the 5-year term of the permit, discharges from the Chicopee WPCF and eighteen (18) CSO outfalls will occur. Discharges from CSO (7.1) will be treated at the Jones Ferry facility. As the constituents and treatment of discharges from these outfalls are different, we will first consider effects of discharges from the WPCF to be followed by a discussion of effects of discharges from the CSO outfalls and the Jones Ferry facility.

Limits on the concentration of pollutants in effluent are included when required for a specific type of facility (e.g.., all WWTPs require certain technology based limits) or when a reasonable potential analysis indicates that there is a reasonable potential for an excursion from a water quality standard (then, a water quality based limit is required). Per EPA policy (59 FR 18688, April 19, 1994), CSO related discharges do not have technology or water quality based limits.

Water quality based limits are required when there is a reasonable potential for the discharge to cause the receiving water to fail to meet water quality standards. When a permit does not contain

a limit for a particular pollutant, it does not necessarily mean that the pollutant is not present in the effluent, but rather that analyses have demonstrated that there is no reasonable potential, at the worst case conditions (i.e., highest design flows from the effluent into lowest water levels in the receiving water), for the discharge to result in an excursion from the water quality criteria.

Water quality criteria are developed by EPA for protection of aquatic life. Both acute (short term exposure) and chronic (long term exposure) water quality criteria are developed by EPA based on toxicity data for plants and animals. Often, both saltwater and freshwater criteria are developed, based on the suite of species likely to occur in the freshwater or saltwater environment. For aquatic life, the national recommended toxics criteria are derived using a methodology published in *Guidelines for Deriving Numeric National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses*. Under these guidelines, criteria are developed from data quantifying the sensitivity of species to toxic compounds in controlled chronic and acute toxicity studies. The final recommended criteria are based on multiple species and toxicity tests. The groups of organisms are selected so that the diversity and sensitivities of a broad range of aquatic life are represented in the criteria values. To develop a valid criterion, toxicity data must be available for at least one species in each of eight families of aquatic organisms. The eight taxa required are as follows: (1) salmonid (e.g., trout, salmon); (2) a fish other than a salmonid (e.g., bass, fathead minnow); (3) chordata (e.g., salamander, frog); (4) planktonic crustacean (e.g., daphnia); (5) benthic crustacean (e.g., crayfish); (6) insect (e.g., stonefly, mayfly); (7) rotifer, annelid (worm), or mollusk (e.g., mussel, snail); and, (8) a second insect or mollusk not already represented. Where toxicity data are available for multiple life stages of the same species (e.g., eggs, juveniles, and adults), the procedure requires that the data from the most sensitive life stage be used for that species.

The result is the calculation of acute (criteria maximum concentration (CMC)) and chronic (criterion continuous concentration (CCC)) criteria. CMC is an estimate of the highest concentration of a material in surface water to which an aquatic community can be exposed briefly (i.e., for no more than one hour) without resulting in an unacceptable effect. The CCC is an estimate of the highest concentration of a material in surface water to which an aquatic community can be exposed indefinitely without resulting in an unacceptable effect. EPA defines "unacceptable acute effects" as effects that are lethal or immobilize an organism during short term exposure to a pollutant and defines "unacceptable chronic effects" as effects that will impair growth, survival, and reproduction of an organism following long term exposure to a pollutant. The CCC and CMC levels are designed to ensure that aquatic species exposed to pollutants in compliance with these levels will not experience any impairment of growth, survival or reproduction.

Very few toxicity tests have been conducted with sturgeon species, and even fewer with shortnose sturgeon. In the absence of species specific chronic and acute toxicity data, the EPA aquatic life criteria represent the best available scientific information. Absent species specific data, we believe it is reasonable to consider that the CMC and CCC criteria are applicable to NMFS listed species as these criteria are derived from data using the most sensitive species and life stages for which information is available. As explained above, a suite of species is utilized to develop criteria and these species are intended to be representative of the entire ecosystem,

including shortnose sturgeon. These criteria are designed to not only prevent mortality but to prevent all "unacceptable effects", which, as noted above, are defined by EPA to include not only lethal effects but also effects that impair growth, survival and reproduction.

For this permit, the relevant water quality criteria are the MA Water Quality Standards, which must be certified by EPA every three years. This certification process is designed to ensure that these water quality standards are consistent with, or more protective than, the EPA national recommended aquatic life criteria. Based on this reasoning, for the purposes of this consultation, we assume that pollutants that are discharged with no reasonable potential to cause excursions in water quality standards will not cause effects that impair growth, survival and reproduction of listed species. Therefore, the effect of the discharge of these pollutants in compliance with MA Water Quality Standards, which by design are consistent with, or more stringent than, EPA's aquatic life criteria, will be insignificant on NMFS listed species. As such, the analysis below will focus on pollutants for which technology based and/or water quality based limits are required by the permit. As explained, water quality based limits are required when it has been determined that there is a reasonable potential for the discharge of a particular pollutant to cause an excursion from attainment of water quality standards in the receiving water. A discussion of the aggregate effects of the discharge is also included below.

Pollutant Discharges at the Chicopee WPCF

Conventional Pollutants

Total Suspended Solids

TSS may affect aquatic life by directly killing them, reducing growth rates, reducing resistance to disease, preventing the development of fish eggs and larvae, by altering natural migration and movement patterns, and by reducing their ability to forage or limiting the food supply (EPA 1976). The proposed permit limits the discharge of TSS to a monthly average of 30.0 mg/L and a weekly average of 45.0 mg/L. Studies of the effects of turbid waters on fish suggest that concentrations of suspended solids can reach thousands of milligrams per liter before an acute toxic reaction is expected (Burton 1993). The studies reviewed by Burton demonstrated lethal effects to fish at concentrations of 580 mg/L to 700,000 mg/L depending on species. Sublethal effects have been observed at substantially lower turbidity levels. For example, prey consumption was significantly lower for striped bass larvae tested at concentrations of 200 and 500 mg/L compared to larvae exposed to 0 and 75 mg/L (Breitburg 1988 in Burton 1993). Studies with striped bass adults showed that pre-spawners did not avoid concentrations of 954 to 1,920 mg/L to reach spawning sites (Summerfelt and Moiser 1976 and Combs 1979 in Burton 1993). While there have been no directed studies on the effects of TSS on shortnose sturgeon, shortnose sturgeon juveniles and adults are often documented in turbid water and Dadswell (1984) reports that shortnose sturgeon are more active under lowered light conditions, such as those in turbid waters. As such, shortnose sturgeon are assumed to be as least as tolerant to suspended sediment as other anadromous fish such as striped bass.

Shortnose sturgeon eggs and larvae are less tolerant to sediment levels than juveniles and adults. Observations in the Delaware River indicated that larval populations may be decimated when

suspended material settles out of the water column (Hastings 1983). Larval survival studies conducted by Auld and Schubel (1978) showed that striped bass larvae tolerated 50 mg/l and 100 mg/l suspended sediment concentrations and that survival was significantly reduced at 1000 mg/l. According to Wilber and Clarke (2001), hatching is delayed for striped bass and white perch eggs exposed for one day to sediment concentrations of 800 and 100 mg/l, respectively.

In a study on the effects of suspended sediment on white perch and striped bass eggs and larvae performed by the Army Corps of Engineers (ACOE) (Morgan *et al.* 1973), researchers found that sediment began to adhere to the eggs when sediment levels of over 1000 parts per million (ppm) were reached. No adverse effects to demersal eggs and larvae have been documented at levels of 50mg/L or below (above the highest level authorized by this permit). Based on this information, and the fact that the discharge limits for the permit are well below the levels recorded for lethal and sublethal effects to fish species and their eggs and larvae any effects of the discharge on shortnose sturgeon in compliance with the TSS permit limits will be insignificant and/or discountable.

Biological Oxygen Demand and Dissolved Oxygen
The biological oxygen demand (BOD_5) water test measures the amount of oxygen used by aerobic microorganisms in the water column. If these aerobic bacteria use the majority of dissolved oxygen in the water, this limits the availability of dissolved oxygen for fish, invertebrates, and other aerobic aquatic organisms. TSS and BOD_5 have the potential to affect dissolved oxygen concentrations in the vicinity of and downstream from the facility's outfall. Shortnose sturgeon are known to be adversely affected by dissolved oxygen levels below 5.0 mg/L (NOAA Fisheries 1998). The Massachusetts Surface Water Quality Standards for Class B Inland Water Classes (which the Connecticut and Chicopee Rives are classified as) require that dissolved oxygen levels shall not be less than 5.0 mg/l. Levels of BOD_5 at the WPCF are required to be 30.0 mg/L monthly and 45.0 mg/L weekly, which are in accordance with the Massachusetts Surface Water Quality Standards and will not contribute to dissolved oxygen levels falling below 5.0 mg/L. It is also noted that the actual discharges from the facility have consistently high dissolved oxygen levels because the facility uses a pure oxygen activated sludge treatment process. Based on this information, the BOD_5 criteria set at the Chicopee WPCF will be protective of shortnose sturgeon found in this segment of the Connecticut River.

pH
The permit requires that the discharge maintain a pH of 6.5-8.3. The pH range of 6.0-9.0is harmless to most marine/aquatic organisms and is within the range of pH designated by the Massachusetts Water Quality Standards for Class B Inland Waters. Impacts to shortnose sturgeon are not likely to occur as a result of the currently established pH limits in this permit.

Bacteria
E. coli bacteria is an indicator of the presence of fecal wastes from warm-blooded animals. As this bacteria is often associated with viruses and other pathogens, the primary concern regarding elevated levels of these bacteria is for human health and exposure to pathogen-contaminated recreational waters. Fecal bacteria are associated with fecal matter, which is known to contain nutrients that support plant and animal growth. Algae and other organisms which utilize these

nutrients can lower dissolved oxygen levels under certain environmental conditions (particularly warm water conditions). While fecal bacteria are not known to be toxic to aquatic life, elevated levels of these bacteria are indicative of water quality problems including lowered dissolved oxygen levels. The draft permit's limits are in accordance with the Massachusetts State Water Quality Standards for Class B Inland Waters (WQS): 126 cfu/100 ml for a geometric mean. A maximum daily limit of 409 cfu/100 ml has been determined by the Massachusetts Department of Environmental Protection (MassDEP) as appropriate for beach notification and closure decisions [314 CMR 4.04(3)(b)4.c]. To protect the public from unacceptable exposure levels, MassDEP has adopted the single sample maximum (SSM) value of 235 colonies/100 ml for all primary contact recreation waters. The 75th percentile SSM is very conservative and appropriate for use on managed beaches that are heavily used. In the NPDES permitting context, the SSM of 409 colonies/100 ml, representing the 90 % confidence level, applied as a maximum daily limit, will identify potential pollution episodes caused by short term spikes in bacteria resulting from plant upset or chlorination failure for less heavily used primary contact recreation areas. The bacterial limits set for the Chicopee WPCF are designed to protect human health and also to insure that dissolved oxygen criteria are met in the receiving water body. As indicated above, the monthly dissolved oxygen level set for this receiving water (5.0mg/L) is protective of shortnose sturgeon. As such, the bacteria limits set in the current permit are not likely to adversely affect shortnose sturgeon or contribute to an excursion above water quality criteria set for this portion of the Connecticut River.

Non-conventional Pollutants

Total Residual Chlorine

Based on the design flow of the WPCF and the dilution calculations, you have determined that a monthly average limit of 0.89 mg/L and daily maximum limit of 1.5 mg/L of Total Residual Chlorine (TRC) would assure that the facility does not exceed the chronic and acute TRC standards (11 ug/L and 19 ug/L, respectively). The calculated daily maximum limit was reduced from 1.5 mg/L to 1.0 mg/L per the Massachusetts Implementation Policy for the Control of Toxic Pollutants in Surface Waters. This Mass DEP policy aims to minimize discharges of chlorine while achieving effective bacteria treatment. Limiting TRC to 1.0 mg/L or below will ensure that there is no reasonable potential for the water quality standards for chlorine to be exceeded.

There are a number of studies that have examined the effects of TRC (Post 1987; Buckley 1976; EPA 1986) on fish; however, no directed studies have examined the effects of TRC on shortnose sturgeon. The EPA has set the Criteria Maximum Concentration (CMC or acute criteria; defined in 40 CFR 131.36 as the highest concentration of a pollutant to which aquatic life can be exposed for a short period of time (up to 96 hours) without deleterious effects) at 0.019 mg/L based on an analysis of exposure of 33 freshwater species in 28 genera (EPA 1986) where acute effect concentrations ranged from 28 ug/L (0.028 mg/L) for *Daphia magna* to 710 ug/L (0.710 mg/L) for the threespine stickleback. The CMC is set well below the minimum effect values observed in any species tested to ensure that the Lowest Observable Effect Level is near zero. As the water quality criteria levels have been set to be protective even the most sensitive of the 33 freshwater species tested, NMFS believes that the criteria are also protective of shortnose

sturgeon. In addition, as noted above, the daily receiving water concentrations required by the permit is 1.0 mg/L, and the monthly average limit is set lower at 0.89 mg/L. The anticipated TRC level at the WPCF satisfies the EPA's ambient water quality criteria and is lower than TRC levels known to affect aquatic life. As such, the effects of TRC levels on shortnose sturgeon allowed by this permit will be insignificant.

Nitrogen
You have determined that excessive nitrogen loadings into the Connecticut River and tributaries are causing significant water quality issues in Long Island Sound which is located approximately 75 miles downstream from the facility. Nitrogen causes impairment via excessive primary productivity and is not known to be directly toxic to aquatic life, including shortnose sturgeon. Elevated nitrogen levels, however, are associated with eutrophication and indicative of water quality problems that may include lowered dissolved oxygen levels. A TMDL has been developed that includes a Waste Load Allocation for Massachusetts, New Hampshire, and Vermont wastewater facilities discharging into receiving waters that empty into Long Island Sound (i.e. Connecticut River and tributaries). The WLA equates to 16,254 lbs/day and is set at the MA/CT border of the Connecticut River to include all facilities that empty into the River and its tributaries. Currently, the WLA is being met, as existing loads have been calculated at 13,836 lbs/day. Additionally, the draft permit contains conditions to ensure that the WLA continues to be met by requiring optimization of nitrogen removal, so that nitrogen loads do not increase over the 2004-2005 baseline of 1,618 lbs/day (average) at the WPCF.

For the draft permit, an evaluation of alternative methods of operation for the existing wastewater treatment facility to control total nitrogen levels is required. Potential methods include: operational changes designed to enhance nitrification (seasonal and year round), incorporation of anoxic zones, septage receiving policies and procedures, and side stream management. The evaluation is required to be completed and submitted to EPA and MassDEP within one year of the effective date of the permit, along with a description of past and ongoing optimization efforts. The draft permit also requires sufficient implementation and optimization methods that ensure that increases in the average daily load of nitrogen do not occur. The permit requires that this information be submitted as annual reports.

Monitoring for nitrogen levels and the establishment of methods to further reduce the loading of nitrogen into the Connecticut River will ensure that the facility is not discharging nitrogen at a level that could impact dissolved oxygen levels that may affect shortnose sturgeon. As such, adverse impacts are unlikely to occur.

Toxic Pollutants
You indicate that an extensive analytical review of data from the facility and a review of WET test reports were performed as part of the NPDES permit update process to determine if the facility discharges toxic pollutants in amounts that have a reasonable potential to cause or contribute to excursions above water quality standards. These data and reports included effluent testing data for over one hundred pollutants including metals and VOCs. Only five metals were detected at levels that required additional analysis. The results indicated that aluminum was the only metal present in the discharge at levels that have a reasonable potential to cause or

contribute to an exceedance of water quality criteria. The acute criterion for aluminum is 0.75 mg/L and the chronic criterion is 0.087 mg/L. In the past, aluminum concentrations in the effluent have been reported as high as 0.13 mg/L which is above the chronic criteria. However, the median receiving water concentration in the Connecticut River, upstream of the outfall from the facility, is 0.11 mg/L which is also above the chronic criterion. Additionally, aluminum has been found to be toxic to aquatic life only in acidic conditions (<5.0 pH), where a level of 0.2 mg/L showed some reduction in growth for eggs and larvae in brook trout (Baker and Schofield 1981). Since the receiving water will not provide dilution of aluminum because of the high median receiving water concentration, the average monthly effluent limit for aluminum has been set at the criterion level of 0.087 mg/L to protect against an excursion above water quality standards in the absence of adequate dilution and to provide protection to aquatic life. Aluminum levels would be further reduced upon entering the Connecticut River at a dilution rate of 81:1. Furthermore, since the pH levels of the Connecticut River are not within the acidic pH range, and aluminum levels at the facility have never been as high as levels where effects were seen in eggs and larvae of brook trout, and early life stages (ELS) have not been observed in this portion of the Connecticut River, any impacts to shortnose sturgeon from the facility's discharge of aluminum will be insignificant and/or discountable.

Whole Effluent Toxicity (WET) Testing

Acute toxicity tests will be conducted on fathead minnow (*Pimephales promelas*) four times per year. Also, during the spring and fall tests (May and November), additional testing will be conducted on brook trout (*Salvelinus fontanalis*)(if not available, rainbow trout (*Onchorynchus mykiss*) will be used). Toxicity testing with both a standard species and a representative species, in conjunction with the currently employed pollutant controls, is sufficient to limit the discharge of toxic substances and to ensure that shortnose sturgeon are unlikely to be adversely affected by the continuing discharge from the facility allowed under this permit for the next five years. This testing regime would use the first two years of data to establish a baseline for the facility. The WET testing schedule is rigorous, and our suggestions to have been incorporated to utilize a representative species to augment the standard testing at this facility. As such, no adverse impacts to shortnose sturgeon are anticipated from the currently proposed WET testing regime. If the results of toxicity tests indicate that the discharge causes an exceedence of any state water quality criteria, additional toxicity testing requirements and chemical limits may be included in a modified permit.

Jones Ferry Facility

The Jones Ferry facility processes the wet weather flow that discharges at CSO 7.1, which is the largest CSO by annual volume in the system. The Jones Ferry facility is only about 1 mile upstream of the WPCF and treats water from one catchment (7.1), but can also receive water from the Connecticut River Interceptor sewage system that connects the CSOs and can store this water during a wet weather event until the storm flows have subsided. This water would then be relayed to the WPCF for secondary treatment. The Jones Ferry facility provides treatment to water discharged at CSO 7.1 in the form of screening, solids removal, dechlorination and disinfection. The effluent limitations are technology based BCT/BAT effluent limitations and include fecal coliform limits of 200 cfu/100 mL average monthly and 400 cfu/100 mL maximum daily to prevent changes in dissolved oxygen levels and comply with water quality standards.

And additionally, the same TRC limitations as used in the WPCF (0.89 mg/L average monthly and 1.0 mg/L maximum daily) are employed at the Jones Ferry facility. The draft permit also requires the reporting of flow, BOD^5, TSS, pH, WET testing, and nitrogen. Since the Jones Ferry Facility only processes stormwater from catchment 7.1, and the storm overflow that is discharged at CSO 7.1 is treated and requires monitoring of all other parameters to ensure that WQS are not exceeded, any impacts to shortnose sturgeon will be insignificant and/or discountable.

CSO Discharges

CSO discharges in Chicopee have been drastically reduced under the existing permit and associated enforcement orders, and further reductions will continue under the draft permit considered here. Thus far, the volume of untreated CSO discharges has been reduced by more than 50% and 18% of the remaining CSO volume with be eliminated in connection with ongoing sewer separation projects. The Chicopee Long Term Control Plan contains a schedule for sewer separation for all CSOs to the Connecticut River which indicates that all CSOs except the Jones Ferry CSO and Treatment Facility will be removed by 2026.

The draft permit re-authorizes discharges of storm water and wastewater from CSOs into the Connecticut and Chicopee Rivers as well as into Willimansett Brook. No records of shortnose sturgeon exist in either the Chicopee River or Willimansett Brook, which is not being considered in the analysis for impacts to listed species. The permit requires that discharges receive treatment at a level of Best Practicable Control Technology Currently Available (BPT), Best Conventional Pollutant Control Technology (BCT) to control and abate conventional pollutants, and Best Available Technology Economically Available (BAT) to control and abate for non-conventional and toxic pollutants. It has been determined by the EPA that BPT, BCT, and BAT for CSO control include the implementation of Nine Minimum Controls (NMC). These controls include: (1) proper operation and regular maintenance programs for the sewer system and CSOs, (2) maximum use of the collection system for storage, (3) review and modification of the pretreatment program to assure CSO impacts are minimized, (4) maximization of flow to the Publicly Owned Treatment Works (POTW) for treatment, (5) prohibition of dry weather overflows from CSOs, (6) control of solid and floatable materials in CSOs, (7) pollution prevention programs that focus on containment reduction activities, (8) public notification to ensure that the public receives adequate notification of CSO occurrences and impacts, and (9) monitoring to effectively characterize CSO impacts and the efficacy of CSO controls. Within six months of the effective date of the final permit, the permittee must submit updated documentation on its implementation of the NMC. Implementation of these controls is required by the effective date of the permit.

In general, the "first flush" of storm water discharge is the most concentrated; however, as it occurs at the beginning of a storm event, before the capacity of the combined sewer system has been met, the first flush generally receives complete treatment as it is conveyed to and treated at the Chicopee WPCF and discharged through Outfall 010, the main outfall for the facility. Additionally, since the Jones Ferry facility can store overflow from CSOs during a wet weather event, additional water held in storage following the "first flush" will be treated at the WPCF once the wet weather subsides. Once the capacity of the combined sewer collection system has

been exceeded, subsequent overflows are released from CSOs into the Connecticut and Chicopee Rivers; however, according to EPA, after the first flushes these effluents are more dilute (i.e., most pollutants were removed in the first flush) and therefore, primary effluent constituents (e.g., TSS, bacteria) are significantly diluted and diluted further upon being discharged to the receiving waters that are already running at high flows and volumes as a result of the storm event. As noted above, TSS and bacteria are primary constituents of CSO discharges and may affect the concentration of dissolved oxygen in receiving waters. During non-storm events, the Connecticut River runs quickly at approximately 8400 cfs in the region near the Holyoke Dam. This increases during storm events and equates to potentially high dilution factors. A relatively high dilution factor is the next tier to dilute CSO discharges after the "first flush" that typically receives treatment at the beginning of a storm event. The further dilution of TSS and bacteria during the storm event, the only time that CSOs would be discharging, will ensure that water quality criteria are met and dissolved oxygen levels are not reduced. As stated previously, CSO discharges are subject to specific conditions of the draft permit including (1) prohibition of dry weather flows, (2) a requirement that CSO discharges shall not cause any exceedance of water quality standards, and (3) compliance with and reporting on compliance with the NMC. These protective measures, which are protective of aquatic life, including shortnose sturgeon, will ensure that any adverse impacts to listed species are insignificant or discountable.

Aggregate Effects Analysis

It is important to examine the aggregate effects of multiple discharges entering an aquatic system to ensure that although the individual components of a discharge system are not having an adverse effect, the larger overall sum of all components together are not contributing to an exceedance above water quality standards that could adversely affect listed species, such as shortnose sturgeon. In general, water quality in the Connecticut River has improved in the past 40 years (Kocan *et al* 1993) and aquatic life criteria are designed to be protective of the most sensitive life stages and species, thus providing protection against long term adverse impacts to shortnose sturgeon in the process.

The WPCF, Jones Ferry Treatment Facility and the CSO discharges are set with limits to prevent the exceedance of WQS in Class B with CSO qualifiers and Class B waters, which are designated waters for aquatic life, including listed species such as shortnose sturgeon. In summary, two water quality parameters: dissolved oxygen and dissolved metals (aluminum), are ultimately the issues of concern. Parameters such as TSS, BOD_5, and bacteria may all affect dissolved oxygen levels in the receiving water body if permit limits are exceeded. Currently, the draft permit sets limits that will allow the facilities (both the WPCF and Jones Ferry Facility) to discharge safely without effects to dissolved oxygen levels. Furthermore, since the WPCF itself is a pure oxygen activated sludge removal facility, additional dissolved oxygen is pumped into the river with the effluent discharges. Since only some discharges from the CSOs that contain stormwater overflow during a storm event are treated, the additional oxygen entering the system may aid in offsetting any dissolved oxygen lowering elements periodically entering the Connecticut River during storm events. Even so, since WQS must be met at all times at CSOs, and the appropriate parameters must be monitored to ensure compliance, coupled with the fact that the "first flush" during a storm even typically is treated and all other overflow is

subsequently more dilute, CSOs are not expected to contribute to the lowering of dissolved oxygen in the Connecticut river and impacts to shortnose sturgeon are not likely to occur.

Aluminum was also detected in the WPCF discharge stream in levels that had reasonable potential to contribute to or cause an excursion above WQS. These metals were only detected at the WPCF and are not expected to be discharged at the CSOs or Jones Ferry Facility. Some toxic pollutants are known to persist in the environment, however dissolved metals tend to disperse rapidly in the receiving water stream (EPA Water Quality Based Toxics Control, 1991). The persistence of the effluent containing metals can vary, but typically, near field regions (i.e. the point of discharge/regulatory mixing zone) may experience some persistence in the environment, whereas far field locations tend to experience effluent decay (EPA Water Quality Based Toxics Control, 1991). As stated previously, aluminum has only been to shown to be toxic to aquatic life in low pH environments, which does not exist in the vicinity of the discharges. This river segment is not a spawning or known optimal foraging area for this species either, thus limiting the presence of shortnose sturgeon in the vicinity of the discharges. As such, aggregate effects from persistent metals or lowered dissolved oxygen levels as a result of the WPCF and its CSOs are not likely to adversely affect shortnose sturgeon.

Conclusions

Based on the above analysis of water quality and the determination that all effects will be insignificant, NMFS is able to concur with EPA's determination that the proposed reissuance of the NPDES permit that re-authorizes discharges from the Chicopee WPCF and its associated CSOs are not likely to adversely affect shortnose sturgeon. A "not likely to adversely affect" determination can only be made when effects on listed species are expected to be beneficial; or adverse effects are expected to be discountable and/or insignificant. As explained in the joint U.S. Fish and Wildlife and NMFS Section 7 Handbook, "beneficial effects are contemporaneous positive effects without any adverse effects. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur." At this time, no further consultation pursuant to Section 7 of the ESA is required. Reinitiation of consultation is required and shall be requested by the Federal agency or by the Service, where discretionary Federal involvement or control over the action has been retained or is authorized by law and: (a) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered in the consultation; (b) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the consultation; or (c) If a new species is listed or critical habitat designated that may be affected by the identified action. NMFS expects that EPA will alert NMFS anytime there is a water quality based permit violation resulting from the operation of this facility.

Technical Assistance for Proposed Species

On October 6, 2010, we published two proposed rules to list five distinct population segments (DPS) of Atlantic sturgeon under the ESA. We are proposing to list four DPSs as endangered (New York Bight, Chesapeake Bay, Carolina and South Atlantic) and one DPS of Atlantic

sturgeon as threatened (Gulf of Maine DPS). Once a species is proposed for listing, as either endangered or threatened, the conference provisions of the ESA may apply (see ESA Section 7(a)(4) and 50 CFR 402.10). As stated at 50 CFR 402.10, "Federal agencies are required to confer with NMFS on any action which is likely to jeopardize the continued existence of any proposed species or result in the destruction or adverse modification of proposed critical habitat."

We have reviewed the proposed action in order to provide guidance to the EPA as to whether a conference is required in this case. Atlantic sturgeon have some potential to travel up the mainstem of the Connecticut River into the state of Massachusetts. Atlantic sturgeon are a long-lived, late maturing, estuarine-dependent, anadromous species, feeding predominantly on benthic invertebrates (ASSRT 2007). They have been historically reported in the Connecticut River as far upstream as Hadley, MA. However, significant evidence that Atlantic sturgeon moved past Enfield, CT into the upper Connecticut River was previously rare since this species tends to remain in the lower river in the range of the salt wedge (River mile 6-16) (Savoy and Shake 1993). In 2006, an adult Atlantic sturgeon was observed in the spillway lift at the Holyoke Dam, providing some indication that this species may move further upstream into the freshwater reaches of the Connecticut River. However, extensive sampling and the lack of any strong evidence of Atlantic sturgeon spawning indicates that the presence of this species in the vicinity of the discharges is unlikely.

According to this information, it is unlikely that any Atlantic sturgeon would be exposed to effects of the proposed action. Based on the analysis presented here, a conference is not necessary at this time.

Should you have any questions regarding these comments, please contact Chris Vaccaro at 978-281-9167 or by email at Christine.Vaccaro@noaa.gov.

Sincerely,

Patricia A. Kurkul
Regional Administrator

Ec: Vaccaro, F/NER3
Boelke, F/NER4
Murphy, Susan, EPA

File Code: H:\H2.0\Section 7\Non-Fisheries\EPA\Informal\2011\INER201103683_Chicopee WPCF NPDES MA0101508_Chicopee WPCF NPDES Reissusance_INER201103683
PCTS: I/NER/2011/03683

References

Atlantic Sturgeon Status Review Team (ASSRT). 2007. Status Review of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*). Gloucester (MA): Report to National Marine Fisheries Service, Northeast Regional Office. Web address: http://www.nmfs.noaa.gov/pr/pdfs/statusreviews/atlanticsturgeon2007.pdf.

Buckley, J., and B. Kynard. 1985. Habitat use and behavior of prespawning and spawning shortnose sturgeon, *Acipenser brevirostrum* in the Connecticut River. Pages 111-117 in F.P. Binkowski and S-1. Doroshov, eds. North American sturgeons: biology and aquaculture potential. Developments in Environmental Biology of Fishes 6. Dr. W. Junk Publishers, Dordrecht, Netherlands. 163 pp

EPA Gold Book 1986. Quality Criteria for Water. EPA 440/5-86-001.

Kieffer, M. C., and B. Kynard. *In press* . Pre-spawning migration and spawning of Connecticut River shortnose sturgeon. In: Life-history and behavior of Connecticut River shortnose sturgeon and other North American sturgeons. AFS Monograph.

Kynard, B. 1997. Life history, latitudinal patterns, and status of the shortnose sturgeon, *Acipenser brevirostrum*. Environmental Biology of Fishes. 48:319-334

Kynard, B., M. Kieffer, M. Burlingame, P. Vinogradov, and B. E. Kynard. *In press* . Biological significance of spawning by shortnose sturgeon at Holyoke Dam. In: Life-history and behavior of Connecticut River shortnose sturgeon and other North American sturgeons. AFS Monograph.

Kocan. R.M. M.B. Matta and S.M. Salazar. 1996. Toxicity of weathered coal tar for shortnose sturgeon (*Acipenser brevirostrum*) embryos and larvae. Archives of Environmental Contaminant Toxicology 31: 161-165.

Post, G.W. 1987. Revised and Expanded Textbook of Fish Health. T.F.H. Publications, New Jersey. 288 pp.

Taubert, B.D. 1980a. Reproduction of the shortnose sturgeon (*Acipenser brevirostrum*) in Holyoke Pool, Connecticut River, Massachusetts. Copeia 1980(1):114-117